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Oral Questions in the European Parliament: A Network Analysis

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Introduction

While the internal working structure in parliaments is of high interest to all students of legislative affairs, parliaments are often a black box in this regard. Social network analysis has already shown its suitability to uncover such hidden structures in other domains such as organizational research (Tichy et al. 1979). Contrary to these advantageous external preconditions the study of networks in legislatures is still a recent development that has (apart from a few early studies such as Patterson (1959)) only begun to unfold during the last decade (e.g. Fowler, 2006; Kirkland, 2011). The fact that most of these studies focus on the US legislature in the form of bill-cosponsorship analyses means that nearly all we know stems from a single presidential system and from data on the legislative process itself. In this paper, we expand on research on legislative networks to the supranational setting of the European Union and non-legislative activities, which are another relevant aspect of parliamentary work (see Russo, 2011:292). We use oral questions (OQs) from the European Parliament (EP) for the legislative term of 2009-2014 to derive and explore the social network among its members (MEPs).

Apart from the interest in exploring an under-researched field, our study taps into several other motivations. First, an important function of parliaments is executive oversight and questions are one way to achieve this (Martin, 2012). Using them to map out the connections among legislators can give us a clearer image of how exactly this function is (collectively) exercised (see Martin, 2011:4). Second, work from presidential (TamCho and Fowler, 2010) and parliamentary systems (Metz and Jäckle, 2016) has uncovered quite different networks – a "small world" of partisan, yet densely interconnected legislators in the former versus strongly parochial parties and a separation of government and opposition in the latter. While these differences can be expected given the different systems of government, analyzing a supranational setting such as the EP can help to gain a deeper understanding of the role of systemic features on network structure. Of particular interest in this regard is the question whether the structuring principle of the OQ-network within the EP is the countries or the parliamentary groups. Finally, inferring connections among legislators is helpful for getting an insight into the inner processes and organizations of parliamentary parties which are difficult to observe otherwise. Certainly, looking at OQs is only one of many ways to approach such questions. Yet, when legislators ask a question together, this directly implies some form social contact between them. The network derived from these relations is then a handy feature to leverage when we want to open as many windows as possible to expose internal structures otherwise not immediately obvious to us.

How to capture social relations among legislators

Legislative networks can either be constructed from direct or indirect measures. Most early studies relied on questionnaires asking legislators directly about their connections, e.g. in terms of friendship (Patterson, 1959) which made these networks easy to interpret. Yet, all sorts of problems associated with surveys (e.g. low response rates or self-selection bias) may undermine the results of this approach. Therefore, the greater part of recent studies uses

indirect measures originating from the regular activities of a parliament to infer ties between its members, as these measures are more reliable, objective and able to depict the network of a whole organization without losing possible knots and ties due to refusals. Recent works have derived legislative networks from three different sources: joint cosponsorship of bills, joint committee membership and joint roll-call votes. In this article we propose a fourth possibility – jointly asked parliamentary questions. The flipside of the indirect approach is that it requires interpretation of what a connection means.

Existing approaches: cosponsorship, roll-call and committee networks

For cosponsorship the argument runs as follows: sponsoring a bill together with others expresses a "joint public stance[.] on policy" (Aleman and Calvo, 2013:357), revealing legislators' preferences. Two potential target groups can be identified: the "matching" or "position-taking" perspective argues that constituents form the main audience for cosponsoring, thus emphasizing electoral incentives (Koger, 2003; Campbell, 1982). The "signaling" or "legislative connection" perspective (Kessler and Krehbiel, 1996; Wilson and Young, 1997) instead argues that cosponsorship is mainly directed at fellow legislators in order to facilitate the passage of bills promoting one's own policy ideals. By connecting to others, parliamentarians build reputation and transmit information as well as support or expertise to key players in the legislature (Aleman and Calvo, 2013:358). Given that evidence has been offered for both perspectives, cosponsorship can be the result of multiple motives and will probably serve both goals to some extent. As such, while it does imply cooperation, this behavior should best be interpreted in a technical sense as "working together" unless other data suggest a more precise interpretation. Irrespective of the different emphasis, both perspectives agree that (co)sponsorship is less dominated by partisan effects than roll-call votes (Highton and Rocca, 2005) so that the revealed preferences are quite reliable, which is especially helpful when parties (and their associated effects on legislators' behavior) are

strong (see Aleman and Calvo, 2013:360). The third most common way to construct legislative networks is to use data on joint membership in committees and sub-committees (Porter et al., 2005). With committees being at a pivotal position in the policy-making process in many legislatures, ties between them can be informative with respect to the specialization of legislators and the overall informal structure of the legislative process. Regarding the resulting networks, a study by Onnela et al. (2012:7) has shown that networks based on voting and cosponsorship are relatively close to each other structurally while committee networks differ from both – at least for the US Congress. For the EP, Patz (2013; 2015) has proven that a committee-based approach works well to identify which of the (currently) 23 committees are central and well connected. Yet, it does not disclose much about how work in the parliament is structured. For this, it makes more sense to concentrate on actions of the MEPs than on their affiliation to committees. With cosponsoring not being possible in the EP (except for amendments in committees, see below) and roll-call votes being better suited for testing whether certain network structures apart from the party and nationality shape the decisions, we require another option to derive a network that describes actual cooperation patterns in the EP. We argue that parliamentary questions (PQs) asked collectively are useful in that regard.

Our approach: networks derived from parliamentary questions

In order to use PQs as a basis for constructing legislative networks, two questions have to be answered: what roles do PQs play in the legislature and what motivates delegates to file them, both on their own and jointly?

The role of parliamentary questions.

PQs are usually seen as a means of extracting information from the government for oversight, linking them to the parliamentary control function (Martin 2013:3). However, most studies also highlight that PQs have limitations in that regard, partly because the usefulness of questioning procedures varies cross-nationally and partly because majority legislators in parliamentary systems are in a principal-agent relation to government, the connection has a strongly cooperative character (Martin, 2012:3; Wiberg, 1995:182). Others argue that oversight alone is too narrow as a perspective since the role of PQs is difficult to separate from the parliamentary function of publicity (Siefken 2010:33). From this vantage point, questions may generate a deterring "threat potential" (Steffani cited in Siefken, 2010:34; see also DeDios, 2012) against executive misconduct because they can extract and publicize any kind of information and demand justification at any time (Siefken, 2010: 32-34). Consequently, PQs allow especially the opposition to raise public awareness for alleged government failures. Therefore, it is no surprise that the opposition usually asks the majority of questions (Siefken, 2010; Rasch, 2009).

Motivations for asking parliamentary questions.

Martin (2012:7f) highlights two main types of motives for asking PQs: government oversight and building up personal reputation. Legislators may focus on holding the government accountable, possibly through public confrontation between governing and opposing parties (Martin, 2012:8; Rasch, 2009:207; see DeDios 2012 for a description of PQs as an accountability game). Related motives include bureaucratic accountability, clarification of government or party policy positions (both by opposition and intra-party wings) or (for a governing party) monitoring the behavior of a coalition partner (Martin, 2013:12f). At the European level, it has been shown that parties who are the opposition in their national parliaments use PQs as instruments of oversight in two ways: first, since they do not have

access to executive oversight at European level, they use these questions to monitor the behavior of the Commission (Proksch and Slapin, 2011:70). Second, they use questions as a "fire alarm" oversight (McCubbins and Schwartz, 1984) to alert the commission about failures of their own national governments to enact EU law (Jensen et al., 2013:270f). Additionally, gathering information (reflecting one's committee specialization) and bothering the Commission (for Eurosceptics) can also be seen as kinds of oversight motives (Proksch and Slapin, 2011:70). The second type of motive, building a personal reputation, is in line with Wiberg's idea (1995:181-183) that self-promotion and re-election may be more important motives than oversight. If seen that way, PQs might serve as instruments with which to send signals to one's constituency to secure a personal vote (Rasch, 2009; Blidook and Kerby, 2012). Party control of the question process reduces this tendency (Rasch, 2011:391). Yet, signaling may also be directed at other addressees rather than constituencies. For example, Bailer (2012:48f) found few questions on local matters in Switzerland. Instead, factors indicating that legislators were "career- and nationally oriented" (and thus, presumably, party-focused) predicted question frequency (Bailer, 2012:51f). Surveys of German and Norwegian legislators confirm that selfish reasons often play a role when asking PQs (Kepplinger, 2008; Rasch, 2011). Much of the process seems to build upon the role of media as a supplier of questions and outlet for answers (Kepplinger, 2008:313).[1] In a nutshell, legislators may draw on the parliament's publicity function by asking questions to raise awareness, shape public opinion about the situation and signal to both their constituencies and parties that they are managing it (Kepplinger, 2008:306-309). Consistent with this idea, candidate list position as a proxy for electoral safety has been found to govern questioning behavior among Romanian legislators in the European Parliament (Chiru and Dimulescu, 2011).

[1] In a comparison of news coverage of parliamentary questions for the Netherlands, France and Germany, van Santen and colleagues (2015:57) found that media attention for oral questions was largest when the topic of the question had already made it to the headlines before.

The only theorizing of why legislators would ask a question together is from Metz and Jäckle (2016). They draw on both a signaling perspective and on the notion of personal expertise, arguing that legislators in the German Bundestag who support others' minor interpellations might do so to signal personal support and show how well connected they are in the party. Additionally, connections could stem from professional support from experts working together to enhance the quality of the question. Compared to cosponsorship networks depicting the internal structure of the parliament that is relevant for the legislative process, structures derived from PQs would thus be different to interpret. With PQs being first and foremost a routine for parliamentary control, a network based on them can be seen as a kind of "oversight coalition". Yet, both network types (cosponsorship and PQ-networks)also have the two related notions of signaling to one's constituency and one's party in common.

State of research on legislative networks

Legislative network studies in the United States

Whereas earlier research on connections between US state legislators, e.g. in terms of friendship or respect, were based on surveys, Fowler (2006) showed for the first time that – instead of direct questionnaires – bill cosponsorship could also be employed to derive support networks among legislators. Using data for both the US House and Senate for 1973-2004, he showed that a measure of the frequency of cosponsoring and the number of supporters predicted legislative influence and roll-call vote choice.

One area of research has focused on legislative networks as independent variables, asking how they shape legislative behavior. Here, a solid finding is that one's connection to others affects voting behavior (see Masket, 2008; Kirkland, 2011). Furthermore Victor and Ringe show that caucuses are not an alternative pathway for junior legislators to gain influence but "a social structure that replicates the formal institutional organization by allowing structurally

disadvantaged members to connect to their colleagues in formal positions of power and influence" (Victor and Ringe, 2009:762). At an aggregate level, the degree to which the cosponsorship network in the US Congress fits a "small world" network (Watts and Strogatz, 1998) predicts its ability to pass important legislation (TamCho and Fowler, 2010).

Others construe legislative networks as dependent variables. Here, studies have identified several factors that drive the formation of a tie: ideological distance, the proximity of legislators' districts, similar social attributes, common ties to a third legislator (Bratton and Rouse, 2011), shared religious denominations, gender (Gross and Sahlizi, 2009, cited in Kirkland, 2011:888), the tendency to reciprocate sponsoring (Burkett and Skvoretz, 2005:23f) as well as institutional constraints such as term limits (Sarbaugh-Thompson et al., 2006) or legislature size (Kirkland, 2014). Additionally, connections between the lower and upper houses in US state legislatures are fostered by factors such as similar party, overlapping districts, leadership position, and a general norm of reciprocity (Kirkland and Williams, 2014). At an aggregate level, studies have mapped out the development of network modularity as a measure of polarization (Zhang et al. 2008) and shown that rising public approval ratings in the long term decrease path length and increase clustering (and modularity) in the US Congress (Kirkland and Gross 2014).[2]

Work on legislative networks outside the US

So far, few studies have analyzed legislative networks in a non-US context. Recently, Aleman and Calvo (2013) examined the determinants of legislative networks (derived from bill initiation data) in the Argentinian (1995-1997) and Chilean (2002-2006) congresses and thus two further presidential systems. They found that "[t]he likelihood of two legislators developing policy ties is significantly higher if these legislators are from the same party, from contiguous electoral districts or have been assigned to work on the same congressional

[2] The Physics and Mathematics community has joined research on legislative networks, although here the focus rests more on the aggregate network (e.g. Porter et al., 2005; Onnela et al., 2012).

committee" (Aleman and Calvo, 2013: 372). Briatte (2015) constructed cosponsorship networks for no less than 29 parliamentary chambers in 21 countries. His work particularly illustrates the huge potential of interactive visualizations of network structures. Metz and Jäckle (2016) looked at support networks for minor interpellations (a form of parliamentary question) in the German parliament. Since interpellations are an instrument of oversight, their network only covers opposition parties, yet it reveals that parties differ markedly in their internal structure. While institutional features dominate for Social Democrats and the Green Party (e.g. star-like structure around group leadership for Social Democrats), the network within the socialist party "Linke" is partly organized around policy fields and partly around factions based on regional origin and gender.

So far, network studies on the EP always focused on certain committees or policy areas, deriving their networks either from surveys amongst the legislators (Ringe et al., 2013) or from cosponsored amendments within single committees (Briatte, 2015). The only network analysis that gives a picture of the complete EP is an article by Mendonca et al. (2015) which uses roll-call votes. Nevertheless, the paper's focus is on methodological questions (namely, on community detection in signed complex networks) and it uses the EP voting data only as a case study to demonstrate the approach which makes it less central from a political-scientific point of view.

Data and network construction

Parliamentary questions in the European Parliament

Members of the European Parliament may ask three different types of PQs: written questions (WQs), questions for oral answers or oral questions (OQs), and questions in the parliament's question hour. While WQs form the largest bulk of material, we chose to concentrate on OQs only because they are a forum in which MEPs cooperate extensively (69.2 per cent of them

are asked by more than one person, see below), making it most likely to observe their underlying organization. OQs can be submitted by either a committee, a party group, or 40 MEPs. They can be directed at both the Commission and the Council and are submitted in written form to the President of the Parliament who refers them to the Conference of Presidents that decides on whether the question is placed on the agenda. If an OQ is included, the MEPs asking the question may give a five-minute speech on it after which a member of the institution concerned responds.

Data collection and network extraction

We collected all 1050 OQs for the 7th EP of 2009-2014 from the Parliament's website and extracted the names of all MEPs who were listed as authors, the question title, date, addressee, and the affiliation given for authors (i.e. whether the question was registered from one or multiple committees and/or party groups). We then collected personal information for all MEPs, including country of origin, parliamentary group affiliation, gender and freshman status in the EP. The network was extracted by going through each question and connecting MEPs that appeared together on a question. We also recorded how often a pair of legislators asked a question together. While for some parliaments the sequence of names on a question may be indicative of different roles (e.g. in Germany, the first name on a minor interpellation is the legislator initiating the interpellation while all others rank as supporters; see Siefken, 2010:28), the sequence of names on OQs in the EP does not follow any clear pattern (personal communication with the bureau of information of the EP in Berlin). We therefore treated the connections as undirected, meaning that all MEPs who have asked a question together are regarded as interconnected. While this approach readily yields a networked structure, one caveat is, of course, that we can only "see" MEPs whose names are on the question. Therefore, both within and between e.g. EPGs, more people may be involved in the necessary

coordination to ask a question. Yet, as their names are not on the final product, these supporting structures remain invisible to us.

Hypotheses

While the main focus of this article is descriptive, i.e. to present a network of the MEPs and investigate its patterns, two hypotheses regarding the peculiarities of the network may be derived:

Metz and Jäckle (2016) have found that parties play a major role in structuring the network of interpellations in the German parliamentary system. However, in presidential systems, where parties are weaker, networks seem to approach a so called “small world” that encompassed most legislators (TamCho and Fowler, 2010; Fowler, 2006a). Taking the EP as an intermediate to both extremes suggests that the party should be less of a defining feature of the network than in parliamentary systems, although it will certainly not disappear. This can be expressed in two hypotheses:

H1a: Members of one and the same parliamentary group ask more OQs together than with members of other parliamentary groups.

H1b: We find more cooperation between members of different parliamentary groups when asking OQs than in parliamentary systems such as Germany.

Also, regional origin has been found to matter for parliamentary as well as presidential systems (Metz and Jäckle, 2016; Fowler, 2006a:469). Given the fact that the EU is far from being as integrated as nation states like Germany or the USA, we assume nationality to be the second most important driving factor for tie formation. This yields our second hypothesis:

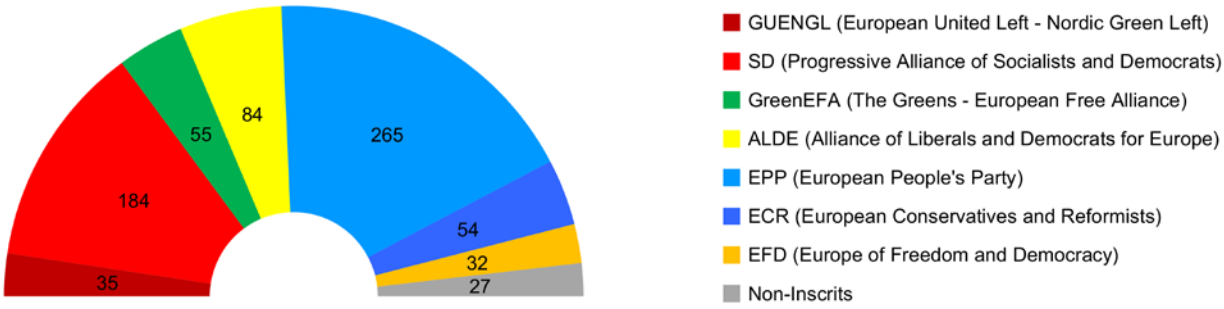
H2: MEPs from the same country issue more questions together than with colleagues from other countries.

Analysis[3]

Description of questions

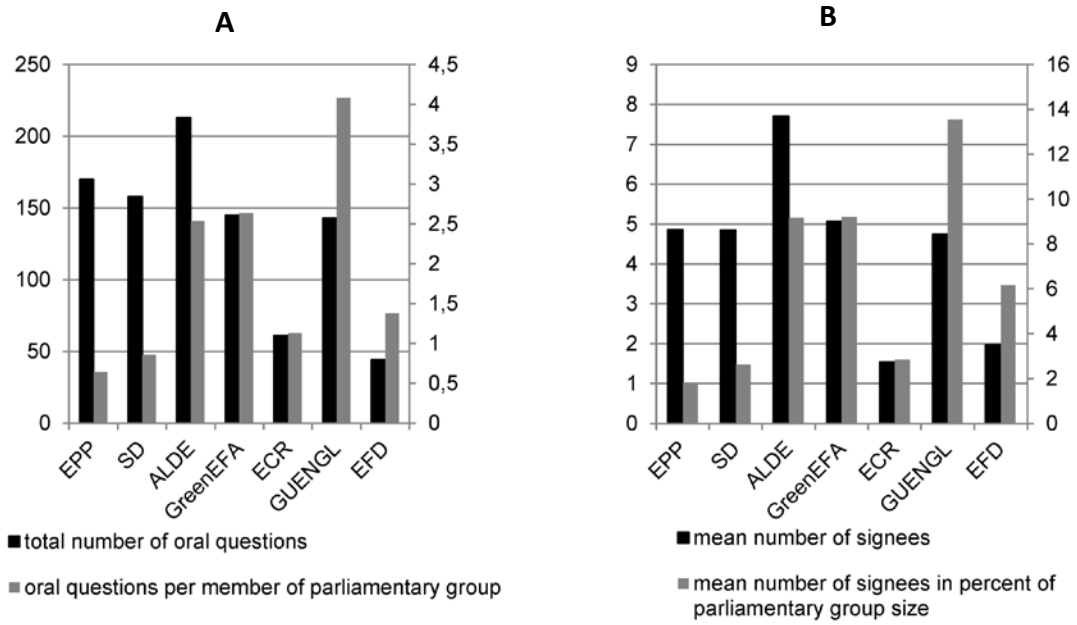
OQs are mostly a partisan matter: of the 1050 OQs, 68.1 per cent were launched by one or more parliamentary group(s) (but not by a committee) while only 27.6 per cent came from a committee (but not from any of the groups); around four per cent (42) were filed by neither, just three questions were supported by at least one committee and at least one group together. ALDE has participated in most questions (213) and EFD in fewest (44) although in terms of group size (see figures 1 and 2a), GUENGL appears most active (4.09 questions per MEP vs. 0.64 for EPP). The number of names on a question differs markedly across groups (see figure 2b). Putting these numbers into the context of group size shows that smaller groups like GUENGL or ALDE generally enjoy a higher share of legislators supporting a question while within the EPP or SD, support is low. The only exception seems to be ECR where on average only 2.8 per cent of legislators support an OQ.

Figure 1: Parliamentary groups in the EP 2009–2014



[3] The network-analysis in this section uses standard network statistics such as degree, density or centrality measures. We explain them in short in turn when we use them. A more detailed description of these network statistics can be found in Newman (2010).

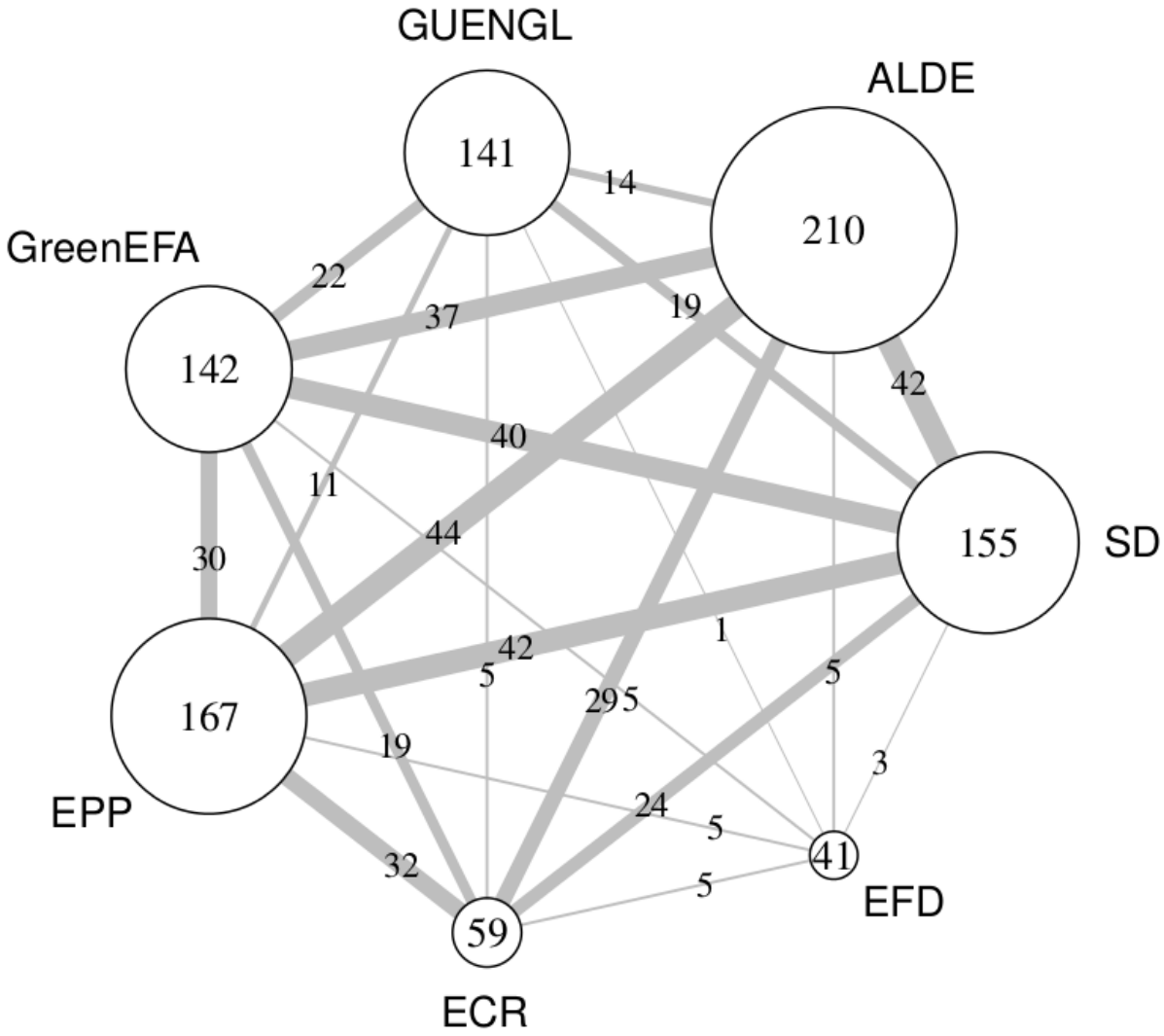
Figure 2: (A) Number of oral questions. (B) Mean number of signees by parliamentary group.



At the individual level, variation in terms of activity is large and skewed with most legislators rather uninvolved in asking questions while a few others dominate the process: of all the 857 legislators in our dataset who sat in the EP between 2009 and 2014 (including those leaving early and their successors), 132 have never asked an OQ. Of the 725 who in some form participated in a question, 47.8 per cent have supported between one and five questions (i.e. on average not more than one OQ a year). On the other end of the scale, a single legislator, Baroness Sarah Ludford (ALDE) has participated in as many as 89 questions, followed by another two ALDE legislators: Sophia in't Veld and Sonia Alfano with 86 and 85 questions, respectively. For the questions initiated by committees, the Committee on Environment, Public Health and Food Safety has been most active with 45 questions (15.4 per cent of all questions initiated by a committee), while only two oral questions were registered from the Committee on Constitutional Affairs. Regarding the addressee, the picture is again quite clear:

three quarters (782, i.e. 74.5 per cent) of questions were directed at the Commission, the remaining 268 were aimed at the Council.[4]

Figure 3: Network of joint oral questions among parliamentary groups.



When asking questions, committees rarely cooperate. Political groups, on the other hand, are somewhat more cooperative. After all, 10.3 per cent of those OQs asked by political groups (which may involve parliamentarians signing onto the question) were asked by at least two groups together, with SD, ALDE, and EPP participating most often in joint questions. When cooperating, political groups show no clear pattern of ideological sorting (see figure 3): while most cooperations were between ALDE and EPP (they supported a question together in 44

[4] However, many of these appear to be in fact "duplicates", given that for 82.1 per cent of all questions aimed at the Council, we find one with an identical title aimed at the Commission.

instances), nearly as many were between SD and EPP, ALDE and SD or Green/EFA and ALDE.

Global description of network

At a global level, the network of legislators consists of 725 nodes, nearly all of which form a single giant component, i.e. they are connected directly or via other legislators. Only five legislators have no connections to others since they have only asked questions alone. For the remaining analysis, we will exclude these five nodes. In terms of edges, the network appears comparatively densely knit, with 19.2 per cent of all possible edges present. This is reflected in a mean degree of 138.2 which states that on average, a legislator is connected to 138.2 other persons in the EP via joint questions. Yet, this value masks some variation. While the modal category (including 72 legislators) has connections to 41-50 others, five legislators have just a single connection, making them highly marginal in the network.[5] On the other side, the three persons with the highest degree are Mariya Gabriel (EPP, 427 connections), Antonija Parwanowa (EPP, 413), and Erminia Mazzoni (ALDE, 392). The high average degree of most legislators is also visible in a comparatively short diameter (= longest shortest path between two vertices) of five.

Legislators in the EP are connected by a total of 49,751 edges. Since we know how often two persons have signed an OQ together, we can use this measure as a rough approximation of their cooperation. The bulk of edges is comparatively weak with 55.0 per cent of edges coming from just a single instance of co-support and another 29.8 per cent stemming from two instances in which two legislators have signed a question together (average edge weight is 1.9). Yet, some edges testify to quite stable relationships: for example Sophie in't Veld and Baroness Sarah Ludford have co-supported 64 OQs.

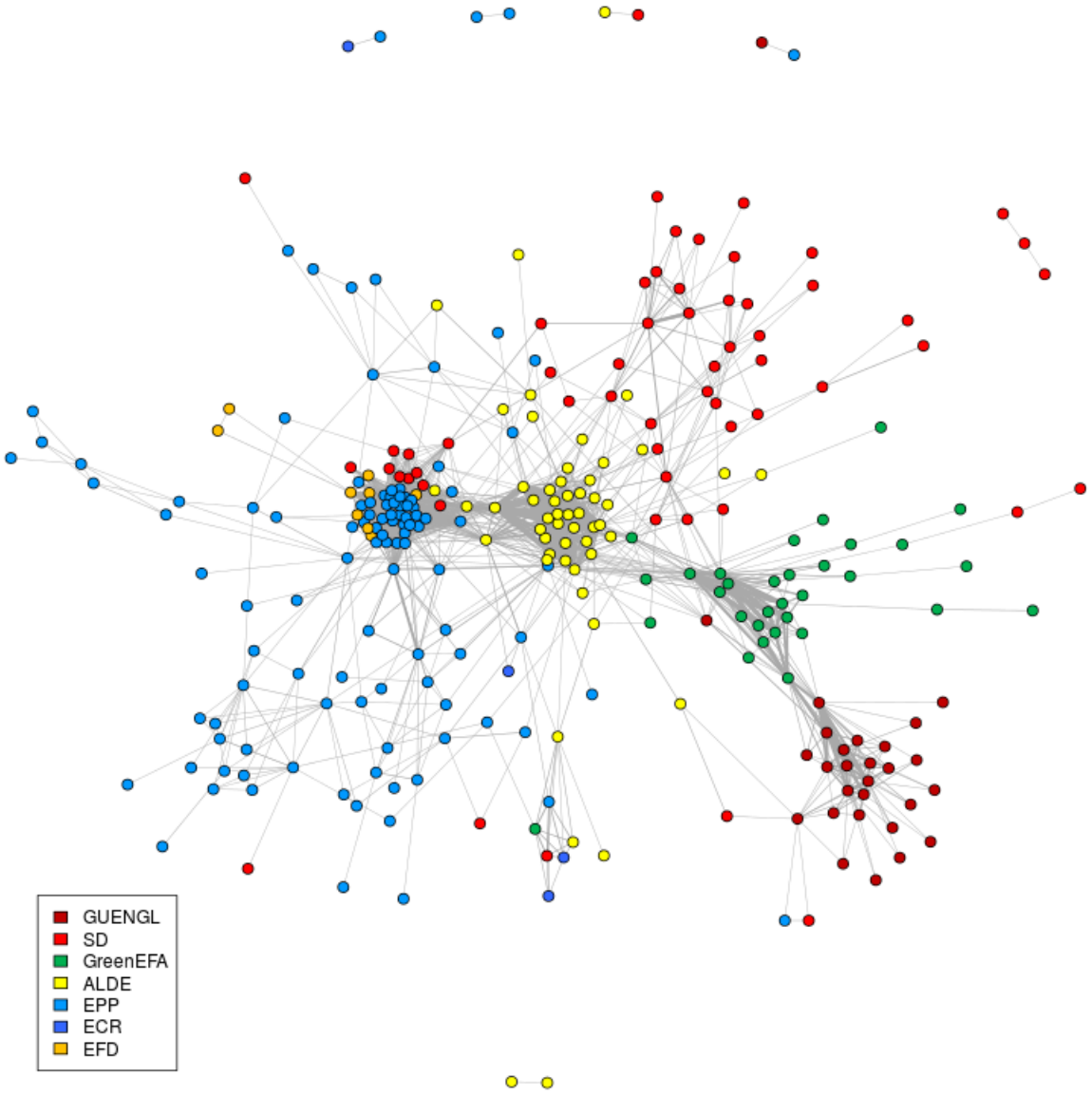
[5] Among them is Nigel Farage (EFD).

The degrees reported above do not take into account that edges may stem from single or multiple instances of asking a question together. If we add up the edge weights for a legislator A (= number of times A supported a question together with B, C, D…) and divide the value by her degree (= number of other legislators connected to A), we get an impression of how strong her contacts are on average. Here, most legislators have fairly low values suggesting generally loose interconnections (the mean across all legislators is 1.74), although some obviously have quite stable cooperations (Jens Rohde (ALDE) has the maximum average of 8.8 co-supports per edge). However, mean and standard deviation of weights across incident edges are strongly correlated (r = 0.879), suggesting that individuals with higher average edge weight do not cooperate evenly across neighbors but rather concentrate on a few strong connections.

In order to make the dense network visually easier to interpret, we temporarily ignore edges with a weight of four or less (meaning that edges only remain when two legislators signed onto a question together at least five times, i.e. on average at least once a year). Doing so, 293 nodes remain connected to at least one other node (including a giant component and six small components consisting of two or three nodes) while the rest becomes isolated. Omitting isolates from the plot, we find that the network already shows the strong role of parliamentary groups visually (see figure 4). As expected, most ties run between members of the same parliamentary group. Between members of different parliamentary groups the clustering seems to be tighter among EPP and ALDE, although it is difficult to tell with so many edges discarded (we will return to this below). There is also a tendency of the nodes to line up along an ideological left-right axis: the reduced graph proceeds from mostly EPP (and some interspersed EFD) legislators on the left hand side of the plot across a cluster of ALDE legislators, from which most SD legislators can be reached in the upper right quadrant to the clusters of Green/EFA and GUENGL in the lower right. ECR legislators are widely absent. In

line with the apparent role of groups no unaffiliated legislators are included in this core network.

Figure 4: Complete network (only edges with a weight of at least 5 are presented)



Legislators' position in the network

Who are the most important actors in the network? Two widely used ways to measure importance in network analysis are closeness centrality and betweenness centrality. Both build on the notion of distance and connections. Because networks do not occupy a space with

an associated metric (such as e.g. physical or ideological proximity), distance is captured as the number of "hops" along edges necessary to reach another node. Since one can in principle take many routes along the edges, distance is always measured along the shortest route.

Closeness centrality therefore calculates for a given node the average distance to all other nodes and ranks those as most central who are on average closest to all other nodes, suggesting that the ability to reach others via social connections is an important property. Betweenness centrality on the other hand, looks at all the shortest paths between all possible pairs of nodes and assesses how often a given node is positioned on these connections, ranking those as most important who come to occupy such a position as a potential mediator most often (assuming that they will more often take part in the exchanges running along edges). Table 1 lists the five most central legislators according to both centrality measures.[6] Regarding closeness, three of the five most central legislators come from ALDE, testifying to the central position of the group which we have already seen in the plot above. For betweenness, Raül Romeva i Rueda (Green/EFA) has by far the highest value. The distribution is strongly skewed with most legislators occupying few to no important mediating positions. Furthermore, ALDE does not occupy such a prominent place anymore as the five legislators with the highest betweenness come from EPP and Green/EFA.

Table 1: The five most central legislators

Closeness centrality	Betweenness centrality
Mariya Gabriel (EPP, 22 questions)	Raül Romeva i Rueda (Green/EFA, 69 questions)
Sonia Alfano (ALDE, 85 questions)	Mariya Gabriel (EPP, 22 questions)
Erminia Mazzoni (EPP, 34 questions)	Sonia Alfano (ALDE, 85 questions)
Marielle de Sarnez (ALDE, 60 questions)	Rui Tavares (Green/EFA, 61questions)
Nathalie Griesbeck (ALDE, 71 questions)	Erminia Mazzoni (EPP, 34 questions)

[6] For our calculations, we used the inverse of edge weights for both closeness and betweenness in order to punish weak edges.

The parliamentary groups

In this section we examine the different parliamentary groups, how they are structured internally and how they relate to each other. To this end, we extracted the networks induced by all its members for each parliamentary group, i.e. each network contains all edges running among group members (but not those pointing to members of other groups).

Groups differ in absolute size and in terms of internal structure (table 2). Both Green/EFA and GUENGL turn up as most dense, with more than half of possible edges present in each. At the other end we find ECR to be more loosely-connected. According to the mean degree values, members of the three biggest groups ALDE, EPP and SD are connected to a high number of other members. Yet, when taken relative to group size, Green/EFA and GUENGL stand out as more cohesive units in which a member is, on average, linked to more than half of the other members. Additionally, the average number of edges varies less for Green/EFA and GUENGL legislators than for those in other groups (see COV degree). When looking at the mean edge weight within groups, Green/EFA and GUENGL are overtaken only by ALDE where an edge consists on average of 4.6 instances of asking a question together. Combined with the high COV over edge weight, these three groups probably have a rather stable core of members asking questions together.

Table 2: Summary statistics of subgraphs induced by group members

	ALDE	ECR	EFD	EPP	Green/ EFA	GUENGL	SD	None
# of nodes	89	42	26	272	60	38	187	11
# of edges	1652	161	90	11422	1033	400	4121	10
density	0.422	0.187	0.277	0.310	0.584	0.569	0.237	0.182
mean degree (relative to # nodes)	37.1 (0.417)	7.7 (0.183)	6.9 (0.266)	84.0 (0.309)	34.4 (0.574)	21.1 (0.554)	44.1 (0.236)	1.8 (0.165)
COV degree	0.499	0.863	0.693	0.520	0.431	0.427	0.670	1.04
mean edge weight	4.6	1.8	2.6	2.2	3.3	4.4	1.6	1.3
COV edge weight	1.77	0.37	0.70	1.14	1.39	1.25	0.77	0.37
degree assortativity	-0.108	0.665	0.331	-0.035	-0.046	-0.184	-0.028	-0.533

COV = Coefficient of Variation

The final statistic on aggregate structure is the coefficient of degree assortativity, which varies between -1 and 1 and measures how nodes connect in terms of their degree. While a positive value indicates that nodes preferably connect to other nodes with a similar degree, creating a core-periphery structure, negative values indicate the tendency of high-degree nodes to connect to low-degree ones. While most groups do not show a clear tendency to sort along these lines, ECR and EFD appear to be positively (i.e. containing a core-periphery-structure), and GUENGL somewhat negatively assortative. For the few MEPs unaffiliated with a group, the value is probably too unreliable to interpret.

Figure 5 shows the subgraphs spanned by legislators from the different groups as full networks, including all legislators, and as a reduced version in which edges with a weight of four or less and isolate nodes have been removed. To facilitate a comparison, the position of nodes appearing in both versions is identical. For EFD and ECR only the full networks are given since edges among legislators are so weak that the networks degraded completely when light edges were discarded.

In general, all groups have clearly identifiable centers where all nodes are connected directly to each other, surrounded by more peripheral regions. The size of these central cliques, in which every legislator is connected to every other legislator, varies across parliamentary groups (from 62 legislators for EPP down to ten individuals for EFD) and usually degrades when lighter edges are ignored, yet, a remaining denser region can nonetheless be identified in all plots. Among the groups, Green/EFA, GUENGL and ALDE stand somewhat apart since their networks all show a large, well-integrated core in the full version which remains clearly discernible when lightweight edges are removed. Nevertheless, all lose a substantial amount of nodes, indicating that many legislators were only loosely tied to the group networks. For EPP and SD, several more densely connected regions become visible, e.g. a cluster of mostly Italian legislators in SD which forms the largest clique at the reduced level of detail (upper

left corner of the plot). Similarly, EPP holds a considerably large maximal clique of only Italians (upper right corner of the plot), accompanied by two more loosely interconnected regions in the left and lower part of the plot. Also, the maximal clique in the ECR subgraph consists mostly of Polish legislators, suggesting that within the groups, nationality may be a driver of network formation.

Figure 5: Subgraphs of the networks by parliamentary group

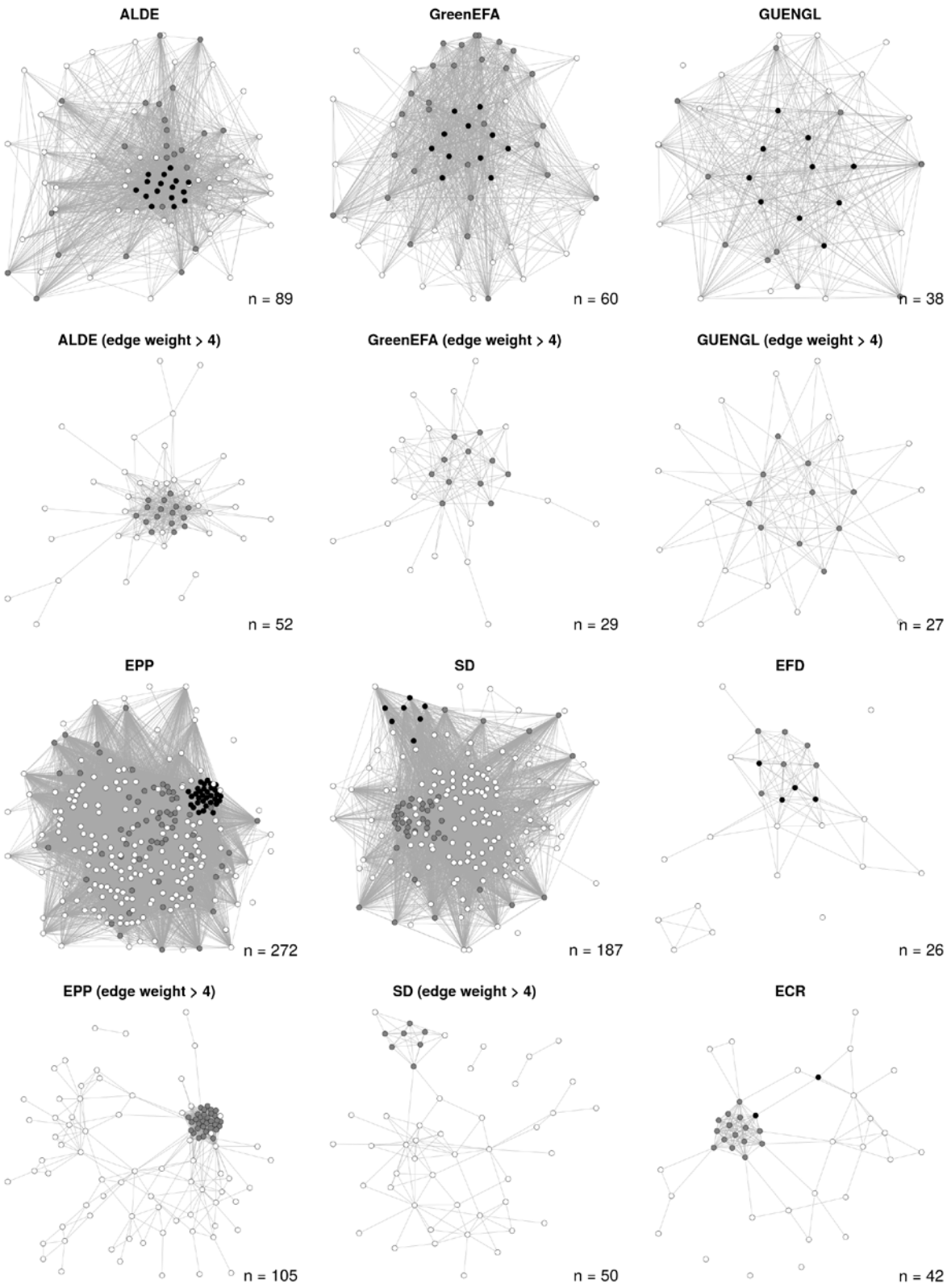


Table 3: Number of edges and average weight running between and within groups (upper right triangle and main diagonal); Lower left triangle: Maximum recorded edge weight (frequency in brackets).

	ALDE	ECR	EFD	EPP	Green/EFA	GUENGL	SD	none	Avg. Weight: In / out
ALDE	1652 (4.59)	363 (1.36)	229 (1.88)	4720 (1.65)	1406 (1.82)	620 (1.53)	3600 (1.59)	169 (1.52)	2.80
ECR	7 (1)	161 (1.84)	117 (1.73)	1344 (1.47)	219 (1.26)	71 (1.45)	542 (1.41)	24 (1.25)	1.28
EFD	7 (2)	3 (9)	90 (2.62)	1211 (2.59)	91 (1.75)	57 (1.91)	424 (1.88)	40 (1.48)	1.16
EPP	10 (1)	10 (1)	12 (5)	11422 (2.17)	2208 (1.54)	1284 (1.46)	7663 (1.63)	482 (1.46)	1.31
Green/EFA	9 (1)	9 (1)	4 (2)	12 (1)	1033 (3.34)	547 (1.89)	1963 (1.60)	102 (1.75)	2.01
GUENGL	5 (3)	4 (4)	4 (1)	5 (3)	24 (1)	400 (4.40)	1065 (1.39)	49 (1.53)	2.89
SD	8 (2)	8 (1)	9 (1)	11 (1)	12 (1)	5 (3)	4121 (1.60)	252 (1.49)	1.00
none	4 (1)	2 (6)	3 (1)	4 (3)	3 (8)	3 (2)	3 (6)	10 (1.30)	0.87

Table 3 sheds light on the way in which groups interconnect on an aggregate level. The values indicate how many edges run between nodes from different groups, the values in brackets show the average weight across the respective edges; the rightmost column indicates the ratio of average weight for edges within the group to those pointing outside. As predicted by H1a groups usually have stronger edges (higher average edge weights) within than among them (as can be seen from comparing diagonal and off-diagonal cells), yet a significant amount of cooperation between different groups can also be observed – by far more than is established from questioning networks in parliamentary systems (see Metz and Jäckle 2016). This seems to confirm H1b. However, although the network is strongly interwoven, most edges among groups are not particularly strong. ALDE, Green/EFA, and GUENGL stand out as comparatively cohesive units with edges within the group being on average two to three times thicker than those pointing to the outside. In contrast, the average edge weights of ECR, SD and unaffiliated legislators outside their grouping do not differ much from or are even lower than the average weights within. For EFD and EPP the ratios of weights within vs. outside

edges are also fairly close to unity but this stems from the fact that both groups have comparatively strong edges running between them. Apart from this, there seems to be no apparent pattern within the weights that would fit the expectation that ideologically closer groups might have more or stronger edges connecting them.

On a personal level, we find indications that interconnections between groups might partly be driven by legislators' nationality as expected by H2. Inspecting who participates in the strongest edges running between pairs of groups, we find several instances in which politicians connecting two groups by above average cooperation often or mostly stem from the same country although parts of these links may also be explained in terms of ideology. For example, EFD and EPP are connected by five edges with a weight of twelve each that run from conservative Italian legislators (Salvatore Tatarella (FLI, EPP), Clemente Mastella (UDEUR, EPP), Paolo Bartolozzi, Roberta Angelilli and Amalia Sartori (all three PLD, EPP)) to Oreste Rossi (Italy, Lega Nord, EFD). Yet, in other cases, strong connections obviously ignore ideological boundaries at the national level, for example when German MEP Andreas Schwab (CDU, EPP) participates in both the heaviest edge to Greens/EFA (with Heide Rühle, Greens; 12 questions) and to SD (with Evelyne Gebhart, SPD; 11 questions). We will return to this notion in the next section.

Structuring properties of the network

So far, parliamentary groups (and possibly national origin) seem to be the main structuring properties of the network, yet other aspects may also play a role for connections among legislators. One way to test this idea more formally is to interpret the group or nation as a partition of nodes, calculate network modularity for it and subject its value to a randomization test to determine its significance (Kirkland 2013, see also Christakis/Fowler 2013). Modularity as the most widely used approach to identify group structures in a network is defined as the number of ties among members of a class of nodes compared to the number

expected by chance (see the appendix for the formula). A modularity value of zero indicates that the partition of interests is meaningless as a structural property (i.e. there are as many edges in the groups as we would expect by chance), while larger absolute values (modularity is strictly below +/-1) indicate that there are either more (positive values) or less (negative values) edges than expected, which in turn means that the partition captures a relevant structural property of the graph. Once we have calculated a modularity value for a given partition, determining its significance is straightforward: keeping the size of groups in the partition fixed, we can (for a large number of iterations) randomly assign nodes to the groups and re-calculate modularity. If our initial value deviates heavily from the resulting distribution, it is significant. Apart from parliamentary group (H1) and country (H2) we also tested three other partitions of nodes: formal position during their term (either in a parliamentary group or in the parliament itself vs. no position), freshman status in 2009 and gender.

Table 4: Modularity simulations

Partition	No. of Edges within groups	No. of Edges between groups	Mean weight within	Mean weight between	Observed modularity	Lower CI 99%	Upper CI 99%
Group	18889	30862	2.37	1.64	0.206***	-0.007	0.005
Country	6364	43387	3.21	1.72	0.119***	-0.006	0.002
Position	26196	23555	1.88	1.95	0.005	-0.006	0.009
Freshman	25236	24515	1.91	1.92	0.002	-0.006	0.010
Gender	26286	23465	1.92	1.90	0.020***	-0.006	0.008

*** = Observed modularity larger or smaller than 99% of simulated values; based on 2000 permutations.

Table 4 presents both the number of edges within and across the five partitions for our network plus their mean weight. While no clear structure appears in the number of edges, both parliamentary group and native country clearly stand out with the mean weight being considerably higher within than between groups. For the other three attributes, differences are

minimal. Calculating modularity yields high values for group (0.206), native country (0.119) and (although smaller by an order of magnitude) for gender (0.020), while values for formal position and freshman status are close to zero. To get a better hold of the meaning of the coefficients, we simulated 2000 networks (separately for each partition) in which we randomly distributed the attribute of interest across the network keeping the size of groups constant (technically we reshuffled node attributes) and recorded the respective modularity statistic. The resulting 99% confidence intervals indicate that both parliamentary group and native country are highly significant as structural patterns in the network. Also, while the value for gender is much smaller it is still clearly significant, showing that women and men prefer to connect among themselves. Formal position and freshman status play no role.

Table 5: Simulation of cohesion among parliamentary groups

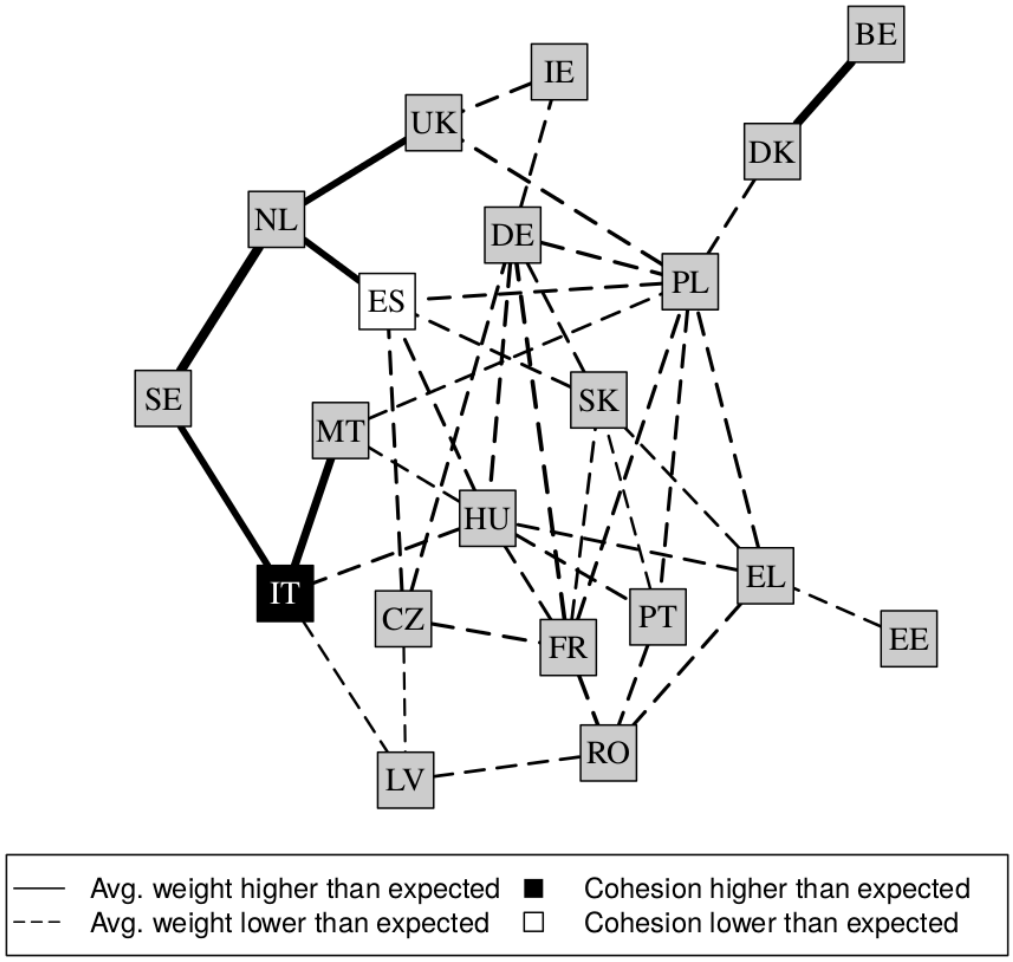
	ALDE	ECR	EFD	EPP	Green/EFA	GUENGL	SD	none
ALDE	**4.59***** (1.52; 2.60) (1.59; 2.34)	**1.36***** (1.52; 2.50) (1.59; 2.34)	**1.88** (1.44; 2.78) (1.52; 2.44)	**1.65***** (1.68; 2.15) (1.73; 2.11)	**1.82** (1.59; 2.42) (1.64; 2.28)	**1.53**** (1.51; 2.59) (1.57; 2.36)	**1.59***** (1.67; 2.23) (1.72; 2.13)	**1.52** (1.28; 2.97) (1.38; 2.70)
ECR		**1.84** (1.37; 3.27) (1.46; 2.86)	**1.73** (1.37; 2.90) (1.45; 2.56)	**1.47***** (1.56; 2.41) (1.63; 2.25)	**1.26***** (1.48; 2.50) (1.58; 2.35)	**1.45**** (1.44; 2.67) (1.51; 2.48)	**1.41***** (1.52; 2.42) (1.63; 2.27)	**1.25***** (1.26; 3.21) (1.36; 2.84)
EFD			**2.62** (1.22; 4.34) (1.30; 3.14)	**2.59***** (1.48; 2.46) (1.54; 2.36)	**1.75** (1.42; 2.85) (1.49; 2.57)	**1.91** (1.34; 2.91) (1.47; 2.65)	**1.88** (1.48; 2.58) (1.53; 2.34)	**1.48** (1.23; 3.98) (1.30; 3.08)
EPP				**2.17**** (1.69; 2.22) (1.73; 2.14)	**1.54***** (1.65; 2.22) (1.69; 2.16)	**1.46***** (1.50; 2.37) (1.60; 2.24)	**1.63***** (1.76; 2.08) (1.79; 2.04)	**1.46** (1.32; 2.83) (1.41; 2.58)
Green/EFA					**3.34***** (1.45; 2.75) (1.51; 2.48)	**1.89** (1.44; 2.48) (1.54; 2.31)	**1.60***** (1.61; 2.27) (1.67; 2.16)	**1.75** (1.28; 3.31) (1.38; 2.84)
GUENGL						**4.40***** (1.29; 3.30) (1.37; 2.78)	**1.39***** (1.54; 2.34) (1.59; 2.27)	**1.53** (1.24; 3.65) (1.32; 2.87)
SD							**1.60***** (1.61; 2.29) (1.68; 2.20)	**1.49** (1.32; 2.85) (1.41; 2.58)
none								**1.30** (1.00; 6.51) (1.00; 4,14)

Confidence intervals in brackets (upper brackets: 99%, lower brackets: 95%). Dark shading: Edge weight significantly exceeds expected weight; light shading: Edge weight significantly below expected weight. Based on 1000 permutations.

Using a similar logic but employing edge weight instead of modularity as the statistic of interest, we additionally simulated 1000 permuted networks to investigate both whether

parliamentary groups and countries of origin vary significantly in terms of their cohesion and connectivity. Both results are captured as the average edge weight between legislators of the same/of two different group(s) and legislators from similar/different countries. Table 5 presents the results for groups: ALDE, Green/EFA, GUENGL and EPP are clearly more cohesive groups as their average edge weight strongly exceeds what can be expected by chance (see main diagonal). In contrast, the mean weight for SD is even below the null-model distribution, indicating that SD-legislators support each other less often than we would expect by mere chance. The remainder of the matrix includes the connectivity measures. We find that only EPP and EFD legislators are more securely connected (= mutual attraction) than we would expect by chance. Apart from that, all departures from randomness suggest repulsion among groups.

Figure 6: Simulation of cohesion among legislators from specific countries



The results for the countries are too large for a table and instead captured in figure 6 as a network in which edges represent the relation between two countries. For easy interpretation, we omitted isolated countries and only retained average edge weights which were significantly above (= mutual attraction) or below (= repulsion) the null-model. Only for Italy (above chance level) and Spain (below) does cohesion differ significantly from randomness, for all others, legislators from the same country maintain on average no stronger edges among themselves than might be expected by chance. Regarding connectivity, the network has a region in the lower right corner, which mostly consists of Central and Eastern European countries connected by negative edges with Poland and Hungary as the two most repulsive countries. Their delegates pose questions together with legislators from their neighbors in the

network (e.g. Germany, France) less often. On the other hand, we find legislators from several Western European countries (Italy, Spain, Denmark, Sweden, Belgium, the Netherlands, the UK, and Malta) posing questions together more often than we would expect by chance. While these results might suggest more cooperation among legislators from countries which have been in the EU for longer, one has to be careful not to overstretch the idea: most edges are fairly close to the boundary of the confidence interval which suggests that the effects are not particularly extreme. This fits the idea that countries show up mostly in somewhat reduced cooperation rather than in legislators sticking together along national lines. Nations play a role as structuring principle, but it is clearly weaker than that of the parliamentary groups.

Discussion and Conclusion

In this article we have explored the connections among members of the European Parliament during the term of 2009-2014 using jointly asked OQs as the basis for a network analysis. Our results show that OQs indeed provide interesting information about the internal structure of the parliament that would otherwise be difficult to obtain. Regarding this structure we find that groups differ quite substantially in the frequency of questions and the fraction of individual legislators supporting one. Also, most legislators are only marginally involved in the business of asking questions with many just supporting one or two questions viz-a-viz a small group of individuals that is highly active. As expected in H1a, the network shows the central role of parliamentary groups. Generally speaking, legislators from one and the same group have more connections to their own fellow group members than to other legislators, and they have stronger edges – i.e. they issue more OQs together. Furthermore, simulation-based permutation tests show (1) that the parliamentary group is clearly the most important structuring principle of the OQ-network and (2) that some groups are more cohesive in terms of edge weights than others. Particularly ALDE, Green/EFA, and GUENGL are cohesive, while SD is internally rather loosely connected. Also, groups seem to shun each other in

general, as indicated by average edge weights below what would be expected by chance. The only exception was a positive attraction between EFD and EPP. Yet, as it has been formulated in H1b in contrast to questions in parliamentary systems such as Germany (see Metz/Jäckle 2016), in the EU parliament there is still a significant amount of cooperation between parliamentary groups when posing OQs – i.e. crossing party lines is definitely an option. In hypothesis H2 we expected that MEPs from the same country issue more questions together than with colleagues from other countries. This is indeed the case. The second most important clustering characteristic next to parliamentary group is a legislators' native country. Legislators from different countries often cooperate a little less than we may attribute to chance (especially if they come from Central or Eastern Europe), while the mean edge weights between legislators from several pairs of Western European countries were above what the null-model predicted. Overall, signs of repulsive forces based on nation and group seem to exist, although they are rather small. Attraction, on the other hand, is visible both more clearly and more strongly based on parliamentary groups (and less on countries).

Given that parliamentary questions are a primary means of executive oversight, our results also address the question of how control of the Council and Commission is implemented at the aggregate level. That the network spans the whole parliament suggests that the function does not follow "parliamentary" terms of government and opposition but is rather reminiscent of the US model. Furthermore, the prominent role of groups vis-à-vis nations suggests that it is primarily driven by ideological considerations although Western European countries might have a tendency to cast oversight in slightly different terms.

While our study has discovered several interesting pieces of evidence concerning the interrelation of members of the European Parliament, it is only the beginning. Several directions are worthwhile exploring: first, regarding the nature of connections, classifying questions according to their content would not only yield leverage to separate specialists from

generalists but also to more clearly spell out how control and oversight as a parliamentary function is subject to a division of labor and how this division is organized. Second, comparing our result for OQs with networks derived from written questions may be especially informative in light of Rasch's (2011) observation that different types of questions exert different attractions on front- and backbenchers. And finally, networks derived from questions could also be compared to those from cosponsoring (at least in legislatures where both is possible). This could lead to a clarification of the different ways parliamentary work is structured depending on the diverse functions of parliaments (e.g. control and legislative activities) and tell to what extent and in which concrete cases networks derived from OQs, such as in this article, can help to understand the otherwise hard to observe internal structure of legislatures.

References

Alemán, Eduardo & Calvo, Ernesto: Explaining Policy Ties in Presidential Congresses: A Network Analysis of Bill Initiation Data, in: Political Studies, 2013, 61:2, 356-377.

Alemán, Eduardo; Calvo, Ernesto; Jones, Mark P. & Kaplan, Noah: Comparing Cosponsorship and Roll-Call Ideal Points, in: Legislative Studies Quarterly, 2009, 34:1, 87-116.

Bailer, Stefanie: People's voice or information pool? The Role of, and Reason for, Parliamentary questions in the Swiss Parliament, in: he Roles and Functions of Parliamentary Questions, ed. Shane Martin and Olivier Rozenberg, Abingdon: Routledge, 2012, 44-56.

Bawn, Kathleen; Cohen, Martin; Karol, David; Masket, Seth; Hans Noel & Zaller, John: A Theory of Political Parties: Groups, Policy Demands, and Nominations in American Politics, in: Perspectives on Politics, 2012, 10:3, 571-597.

Blidook, Kelly & Kerby, Matthew: Constituency Influence on "Constituency Members": The Adaptability of Roles to Electoral Realities in the Canadian Case, in: The Roles and Functions of Parliamentary Questions, ed. Shane Martin and Olivier Rozenberg, Abingdon: Routledge, 2012, 69-81.

Bratton, Kathleen A. & Rouse, Stella M.: Networks in the Legislative Arena: How Group Dynamics Affect Cosponsorship, in: Legislative Studies Quarterly, 2011, 36:3, 423-460.

Briatte, Francois: Legislative Cosponsorship Networks, online: http://f.briatte.org/parlviz/

Burkett, Tracy & Skvoretz, John: Political Support Networks Among US Senators: Stability and Change from 1973 to 1990, 2005. Online: http://www.researchgate.net/profile/John_Skvoretz/publication/228382999_Political_Support_networks_among_US_Senators_Stability_and_Change_from_1973_to_1990/links/09e415064aba206dc2000000.pdf

Campbell, James E.: Cosponsoring Legislation in the U. S. Congress, in: Legislative Studies Quarterly, 1982, 7:3, 415-422.

Carey, John M. & Shugart, Matthew S.: Incentives to cultivate a personal vote: A rank ordering of electoral formulas , in: Electoral Studies , 1995, 14:4, 417-439.

Chiru, Mihail & Dimulescu, Valentina-Andreea: Tribunes Versus Experts: An Analysis Of The Romanian MEPs Questions, in: CEU Political Science Journal. Vol. 6, No. 1, 2011, 6:1, 1-21.

Christakis, Nicholas A. & Fowler, James H.: Social contagion theory. Examining dynamic social networks and human behavior, in: Statistics in Medicine, 2013, 32:4, 556-577.

de Dios, Manuel S. & Wiberg, Matti: Questioning in European Parliaments, in: The Roles and Functions of Parliamentary Questions, ed. Shane Martin and Olivier Rozenberg, Abingdon: Routledge, 2012, 96-109.

Fenno, Richard F.: Congressmen in committees, 1973, Boston: Little, Brown and Co.

Fowler, James H.: Connecting the Congress: A Study of Cosponsorship Networks, in: Political Analysis, 2006, 14:4, 456–487.

Fowler, James H.: Legislative cosponsorship networks in the US House and Senate, in: Social Networks, 2006, 28:4, 454 - 465.

Heaney, Michael T.; Masket, Seth E.; Miller, Joanne M. & Strolovitch, Dara Z.: Polarized Networks: The Organizational Affiliations of National Party Convention Delegates, in: American Behavioral Scientist, 2012, 56:12, 1654-1676.

Highton, Benjamin & Rocca, Michael S.: Beyond the Roll-Call Arena: The Determinants of Position Taking in Congress, in: Political Research Quarterly, 2005, 58:2, 303-316.

Jensen, Christian B.; Proksch, Sven-Oliver & Slapin, Jonathan B.: Parliamentary Questions, Oversight, and National Opposition Status inthe European Parliament, in: Legislative Studies Quarterly, 2013, 38:2, 259-282.

Kepplinger, Hans M.: Kleine Anfragen: Funktionale Analyse einer parlamentarischen Praxis, in: Res publica semper reformanda, ed. Patzelt, Werner J. and Sebaldt, Martin and Kranenpohl, Uwe, Wiesbaden: VS Verlang, 2008, 304-319.

Kessler, Daniel & Krehbiel, Keith: Dynamics of Cosponsorship, in: The American Political Science Review, 1996, 90:3, 555-566.

Kirkland, Justin H. & Gross, Justin H.: Measurement and theory in legislative networks: The evolving topology of Congressional collaboration , in: Social Networks , 2014, 36:0, 97-109.

Kirkland, Justin H. & Williams, R. L.: Partisanship and Reciprocity in Cross-Chamber Legislative Interactions, in: The Journal of Politics, 2014, 76:, 754-769.

Kirkland, Justin H.: Chamber Size Effects on the Collaborative Structure of Legislatures, in: Legislative Studies Quarterly, 2014, 39:2, 169-198.

Kirkland, Justin H.: Hypothesis Testing for Group Structure in Legislative Networks, in: State Politics & Policy Quarterly, 2013, 13:2, 225-243.

Kirkland, Justin H.: The Relational Determinants of Legislative Outcomes: Strong and Weak Ties Between Legislators, in: The Journal of Politics, 2011, 73:, 887-898.

Koger, Gregory; Masket, Seth & Noel, Hans: Partisan Webs: Information Exchange and Party Networks, in: British Journal of Political Science, 2009, 39:, 633-653.

Koger, Gregory: Position Taking and Cosponsorship in the U.S. House, in: Legislative Studies Quarterly, 2003, 28:2, 225-246.

Martin, Shane: Parliamentary Questions, Rockefeller College University at Albany. Center for International Development, Comparative Assessment of Parliaments Note, 2013, online: http://www.cid.suny.edu/capnotes1/Cap_note_Martin041713.pdf

Martin, Shane: Parliamentary Questions, the Behavior of Legislators, and the Function of Legislatures: An Introduction, in: The Journal of Legislative Studies, 2012, 17:3, 1-12.

Martin, Shane: Parliamentary Questions, the Behavior of Legislators, and the Function of Legislatures: An Introduction, in: The Roles and Functions of Parliamentary Questions, ed. Shane Martin and Olivier Rozenberg, Abingdon: Routledge, 2012, 1-12.

Martin, Shane: Parliamentary Questions, the Behaviour of Legislators, and the Function of Legislatures: An Introduction, in: The Journal of Legislative Studies, 2011, 17:3, 259-270.

Masket, Seth E.: Where You Sit is Where You Stand: The Impact of Seating Proximity on Legislative Cue-Taking, in: Quarterly Journal of Political Science, 2008, 3:3, 301-311.

Masket, Seth: Party Networks, Oxford Bibliographies: Political Science, 2013, online: http://www.oxfordbibliographies.com/view/document/obo-9780199756223/obo-9780199756223-0091.xml

McCubbins, Mathew D. & Schwartz, Thomas: Congressional Oversight Overlooked: Police Patrols versus Fire Alarms, in: American Journal of Political Science, 1984, 28:1, 165-179.

Mendonca, Israel; Figueiredo, Rosa; Labatut, Vincent; Michelon, Philippe: Relevance of Negative Links in Graph Partitioning: A Case Study Using Votes from the European Parliament, 2015, online: http://arxiv.org/abs/1507.04215

Metz, Thomas & Jäckle, Sebastian: Hierarchical, Decentralized, or Something Else? Opposition Networks in the German Bundestag, in Legislative Studies Quarterly, 2016, 41:2.

Newman, M. E. J.: Modularity and community structure in networks, in: Proceedings of the National Academy of Sciences, 2006, 103:23, 8577-8582.

Newman, M. E. J.: Networks. An introduction. Oxford: Oxford University Press. Chapters 6 (concepts of network analysis) and 7 (measures), 2010.

Onnela, Jukka-Pekka; Fenn, Daniel J.; Reid, Stephen; Porter, Mason A.; Mucha, Peter J.; Fricker, Mark D. & Jones, Nick S.: Taxonomies of networks from community structure, in: Physical Review E, 2012, 036104.

Parigi, Paolo & Sartori, Laura: The political party as a network of cleavages: Disclosing the inner structure of Italian political parties in the seventies , in: Social Networks , 2014, 36:0, 54 - 65.

Patterson, Samuel C.: Patterns of Interpersonal Relations in a State Legislative Group: The Wisconsin Assembly, in: Public Opinion Quarterly, 1959, 23:1, 101-109.

Patz, Ronny: Information flows in the context of EU policy-making. Dissertation thesis, Department of Economic and Social Sciences, University of Potsdam, 2014, online: https://publishup.uni-potsdam.de/opus4-ubp/frontdoor/index/index/docId/6824

Patz, Ronny: The committee structure of the European Parliament visualized, 2015, online: http://polscieu.ideasoneurope.eu/2015/02/25/committee-structure-european-parliament-visualised/

Porter, Mason A.; Mucha, Peter J.; Newman, M. E. J. & Warmbrand, Casey M.: A network analysis of committees in the U.S. House of Representatives, in: Proceedings of the National Academy of Sciences of the United States of America, 2005, 102:20, 7057-7062.
Proksch, Sven-Oliver & Slapin, Jonathan B.: Parliamentary questions and oversight in the European Union, in: European Journal of Political Research, 2011, 50:1, 53-79.

Rasch, Bjørn E.: Behavioural Consequences of Restrictions on Plenary Access: Parliamentary Questions in the Norwegian Storting, in: The Journal of Legislative Studies, 2011, 17:3, 382-393.

Rasch, Bjørn E.: Opposition Parties, Electoral Incentives and the Control of Government Ministers: Parliamentary Questioning in Norway, in: Parlamente, Agendasetzung und Vetospieler Festschrift für Herbert Döring, ed. Steffen Ganghof and Christoph Hönnige and Christian Stecker, Wiesbaden: VS Verlag, 2009, 199-214.

Ringe, Nils; Victor, Jennifer N. & Gross, Justin H.: Keeping Your Friends Close and Your Enemies Closer? Information Networks in Legislative Politics, in: British Journal of Political Science, 2013, 43:, 601-628.

Russo, Federico: The Constituency as a Focus of Representation: Studying the Italian Case through the Analysis of Parliamentary Questions, in: The Journal of Legislative Studies, 2011, 17:3, 290-301.

Sarbaugh-Thompson, Marjorie; Thompson, Lyke; Elder, Charles D.; Comins, Meg; Elling, Richard C. & Strate, John: Democracy among Strangers: Term Limits' Effects on Relationships between State Legislators in Michigan, in: State Politics & Policy Quarterly, 2006, 6:4, 384-409.

Siefken, Sven T.: Parlamentarische Anfragen -- Symbolpolitik oder wirksames Kontrollinstrument?, in: Zeitschrift für Parlamentsfragen, 2010, 41:1, 18–36.

Tam Cho, Wendy K. & Fowler, James H.: Legislative Success in a Small World: Social Network Analysis and the Dynamics of Congressional Legislation, in: The Journal of Politics, 2010, 72:, 124-135.

Tichy, Noel M., Tushman, Michael L. & Fombrun, Charles, in: The Academy of Management Review, 1979, 4:4, 507-519.

van Santen, Rosa; Helfer, Luzia & van Aelst, Peter: When politics becomes news: An analysis of parliamentary questions and press coverage in three West European countries, in: Acta Politica, 2015, 50:1, 45-63.

Victor, Jennifer N. & Ringe, Nils: The Social Utility of Informal Institutions: Caucuses as Networks in the 110th U.S. House of Representatives, in: American Politics Research, 2009, 37:5, 742-766.

Watts, Duncan J. & Strogatz, Steven H.: Collective dynamics of small-world networks, in: Nature, 1998, 393:6684, 440-442.

Wiberg, Matti: Parliamentary Questioning: Control by Communication?, in: Parliaments and majority rule in Western Europe, ed. Herbert Döring, Frankfurt: Campus, 179-222.

Wilson, Rick K. & Young, Cheryl D.: Cosponsorship in the U. S. Congress, in: Legislative Studies Quarterly, 1997, 22:1, 25-43.

Zhang, Yan; Friend, A. J.; Traud, Amanda L.; Porter, Mason A.; Fowler, James H. & Mucha, Peter J.: Community Structure in Congressional Cosponsorship Networks, in: Physica A. Statistical Mechanics and its Applications, 2008, 387:, 1705-12.

Appendix

Modularity is defined as $Q = \frac{1}{2m}\sum_{i,j}\left(A_{ij} - \frac{k_i k_j}{2m}\right)\delta\left(c_i, c_j\right)$ with m number of edges, A_{ij} denoting the element in row i, column j of the adjacency matrix A, k_i and k_j denoting the degree of nodes i and j, respectively, ci and cj the type of nodes i and j, and $\delta(x, y)$ standing for the Kronecker delta which is 1 if $x = y$ and 0 otherwise.